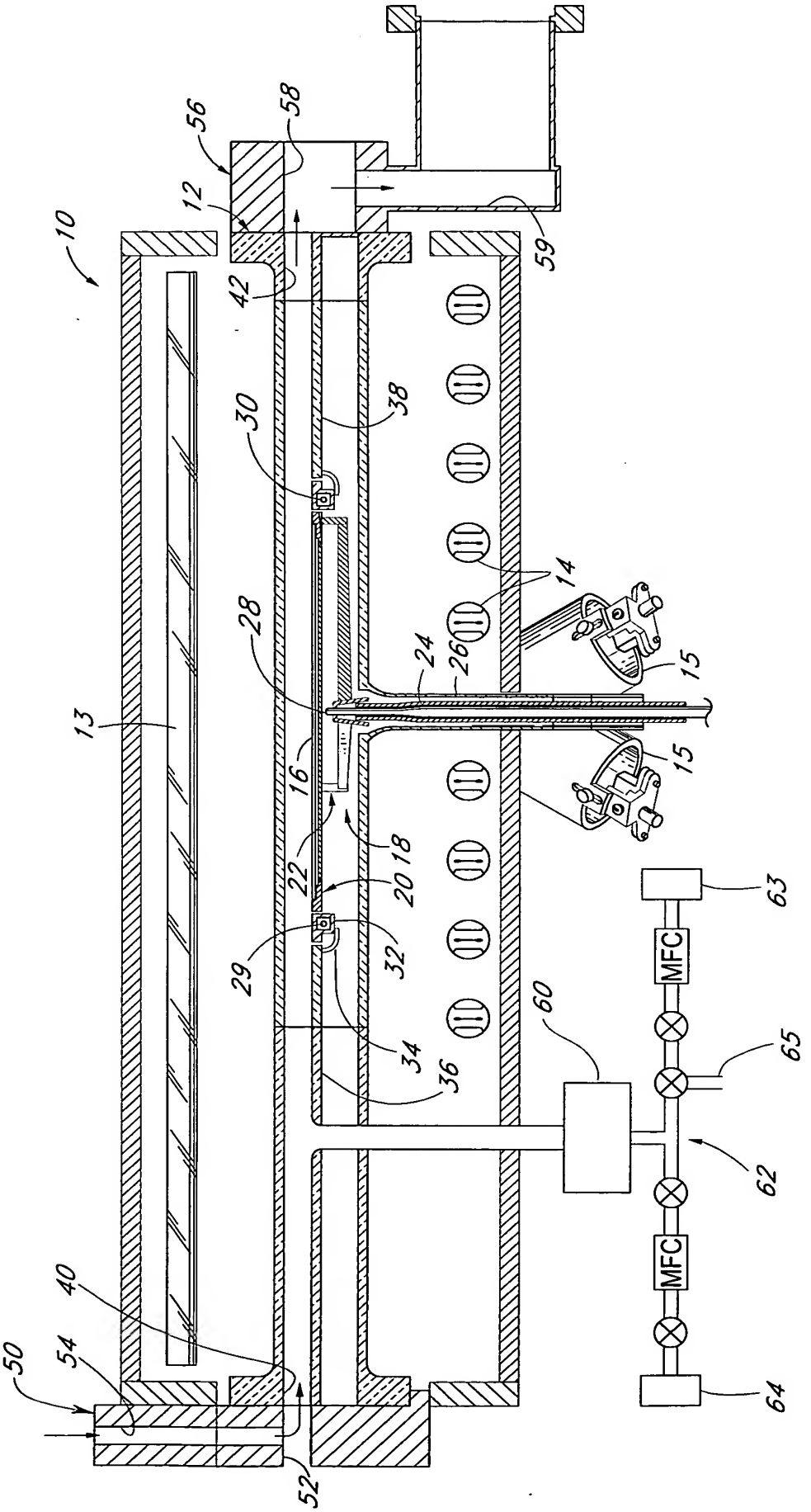
10
12
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28
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32
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38
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42
50
52
54
56
58
59
60
62
63
64
65
MFC
MFC

FIG. 1

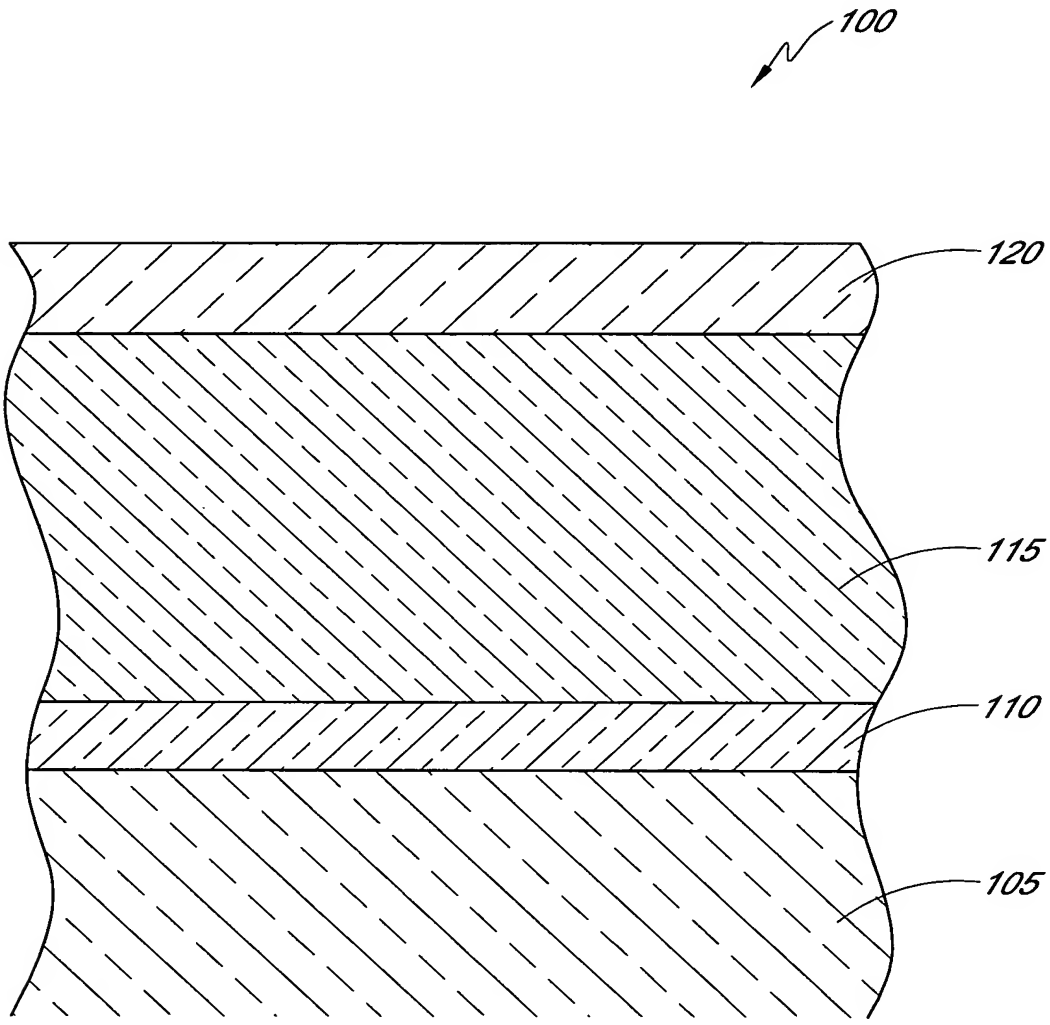

FIG. 2

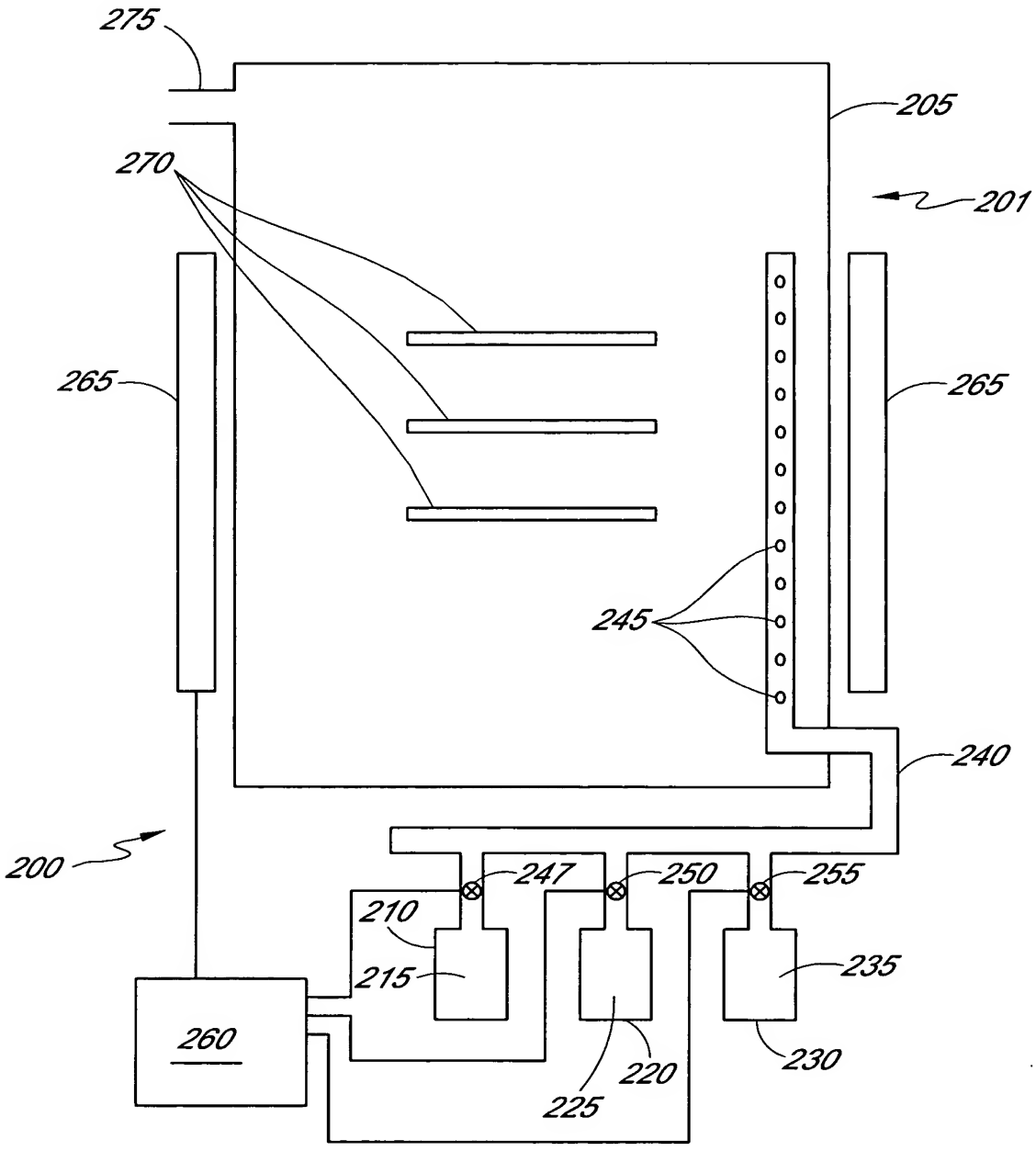
275
205
270
201
265
265
245
240
200
247
250
255
210
215
235
260
220
230
225

FIG. 3

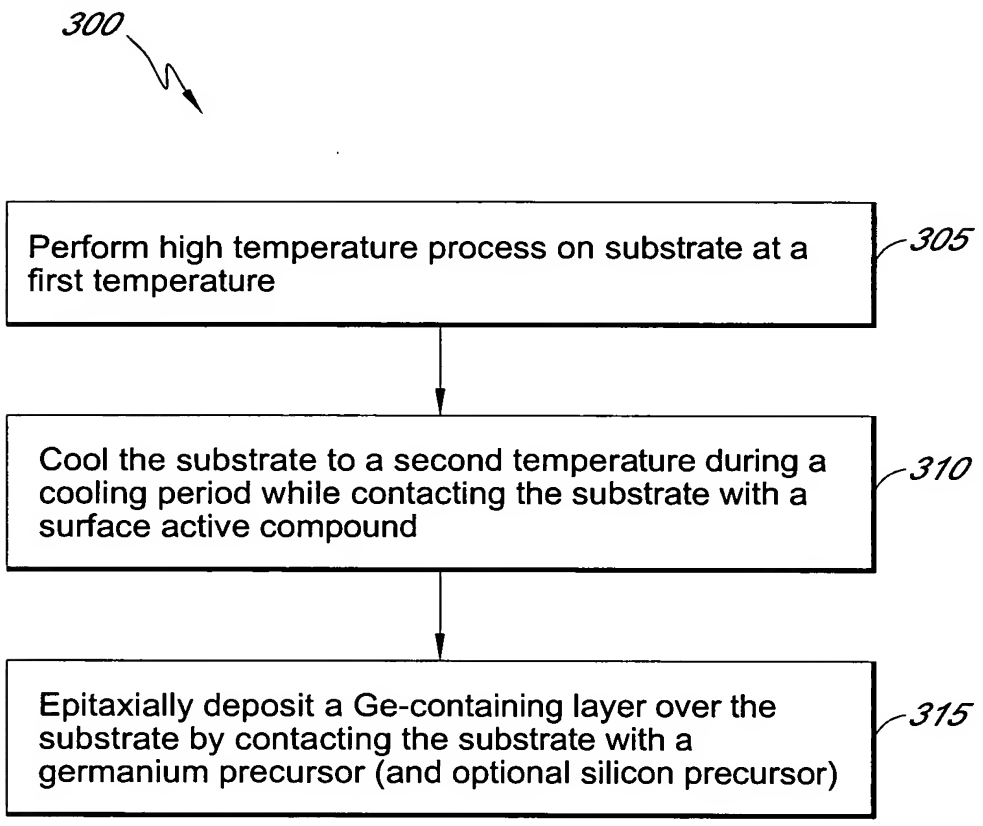
300
Perform high temperature process on substrate at a first temperature
305
Cool the substrate to a second temperature during a cooling period while contacting the substrate with a surface active compound
310
Epitaxially deposit a Ge-containing layer over the substrate by contacting the substrate with a germanium precursor (and optional silicon precursor)
315

FIG. 4

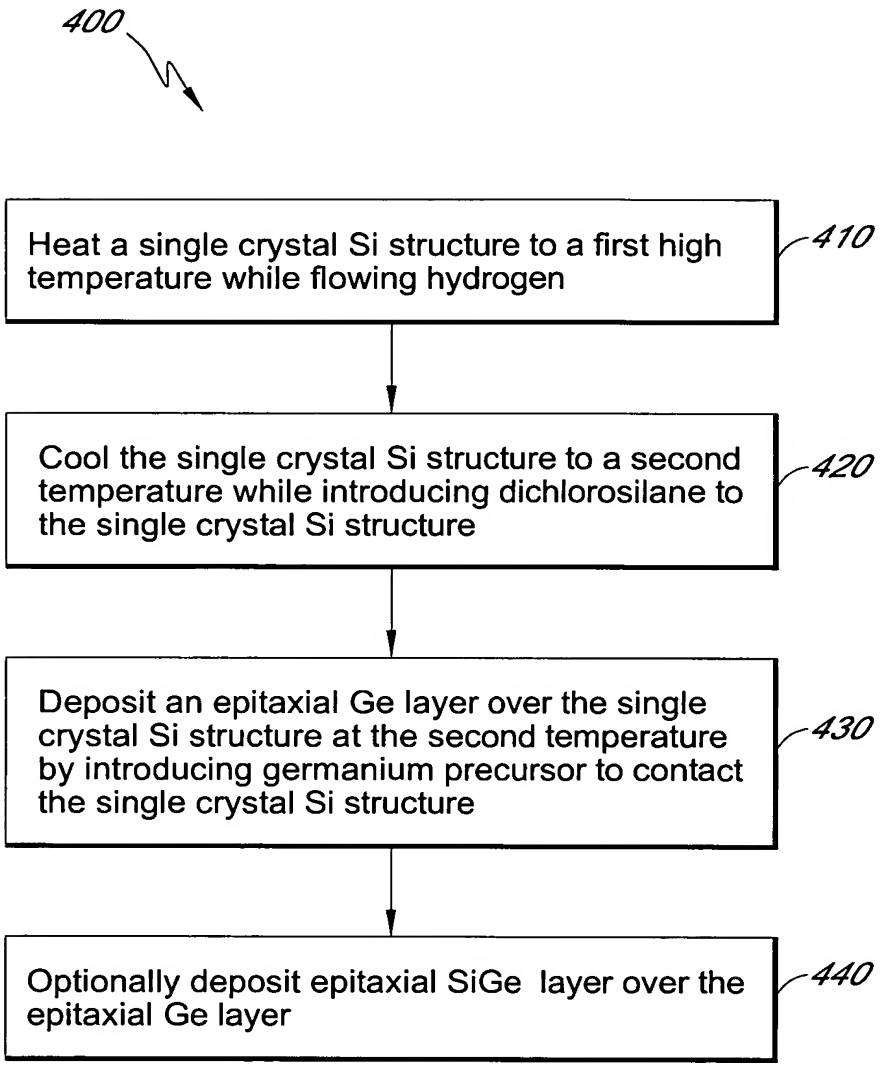
400
Heat a single crystal Si structure to a first high temperature while flowing hydrogen
410
Cool the single crystal Si structure to a second temperature while introducing dichlorosilane to the single crystal Si structure
420
Deposit an epitaxial Ge layer over the single crystal Si structure at the second temperature by introducing germanium precursor to contact the single crystal Si structure
430
Optionally deposit epitaxial SiGe layer over the epitaxial Ge layer
440

FIG. 5

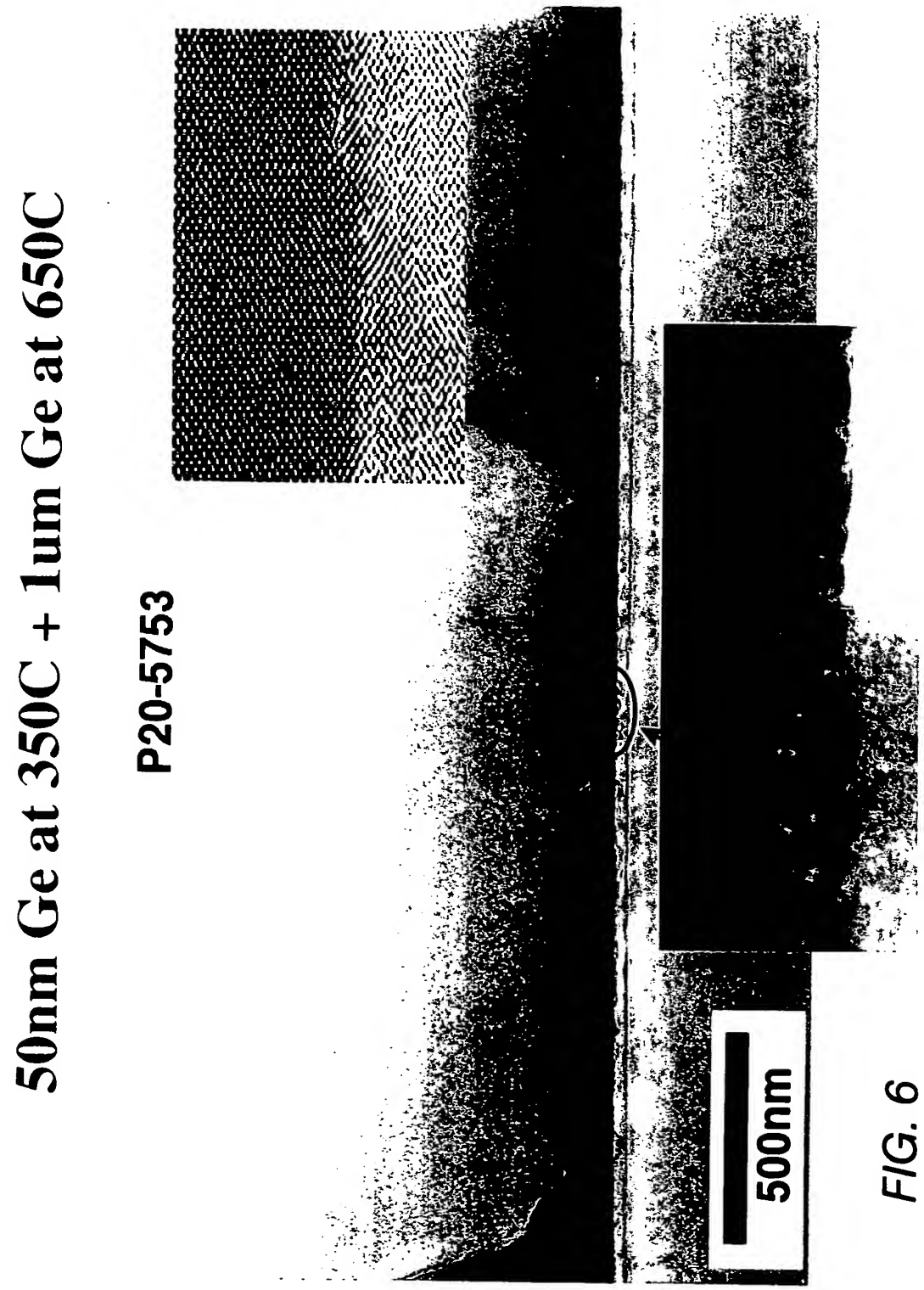

FIG. 6

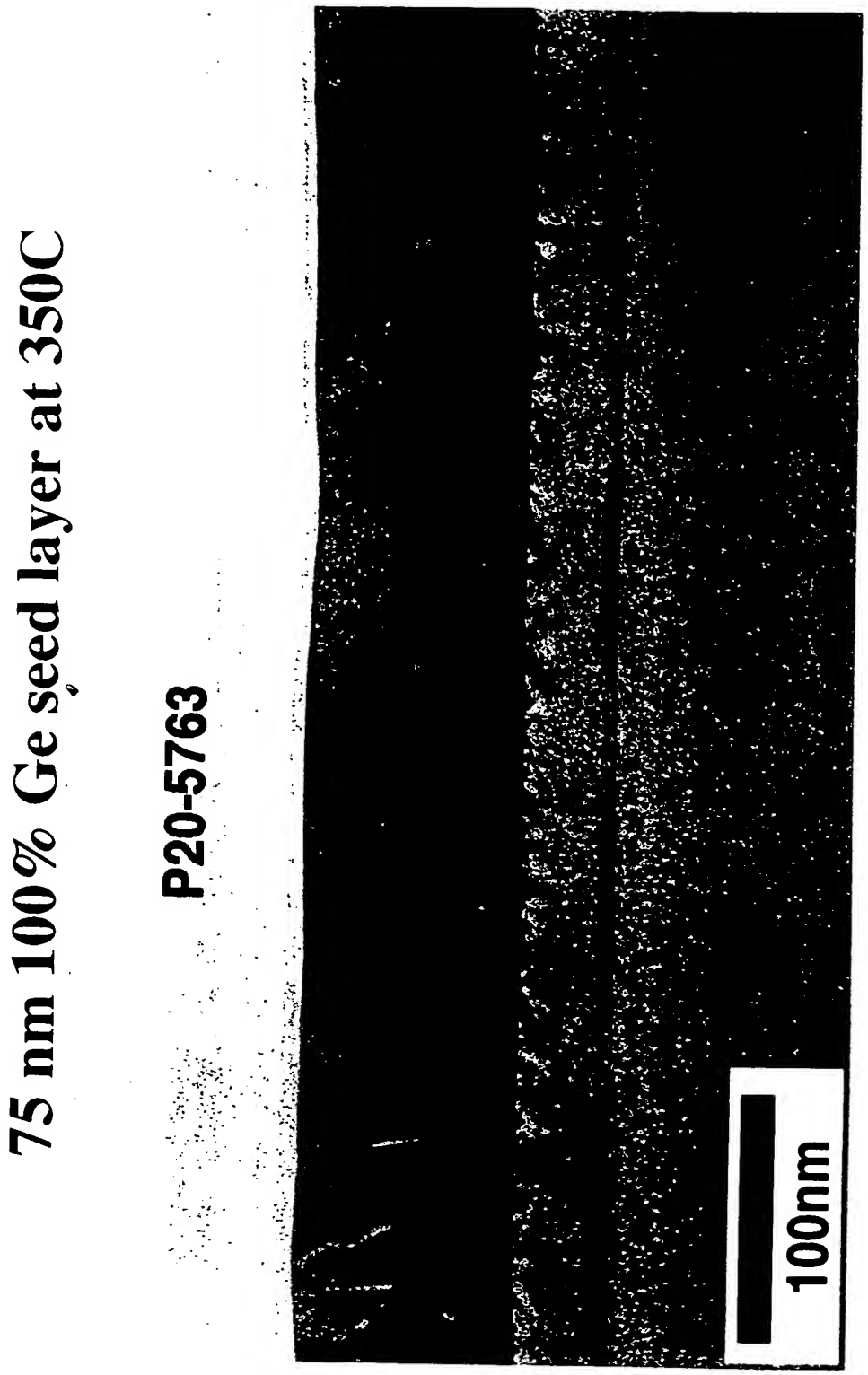

FIG. 7

Germanium EPD

- 35 ml AcOH
- 10 ml HNO_3
- 5ml HF
- 8 mg I_2

H.S. Luan et al, MIT
APL 75(99)2909

- Mag x 1000
- 108 x 82 um^2
- EPD ~ 10^7 cm^{-2}

FIG. 8

As-doped germanium

3 sccm arsine (1% in H_2)
mag. 200x
resistivity 19.65 mΩ•cm

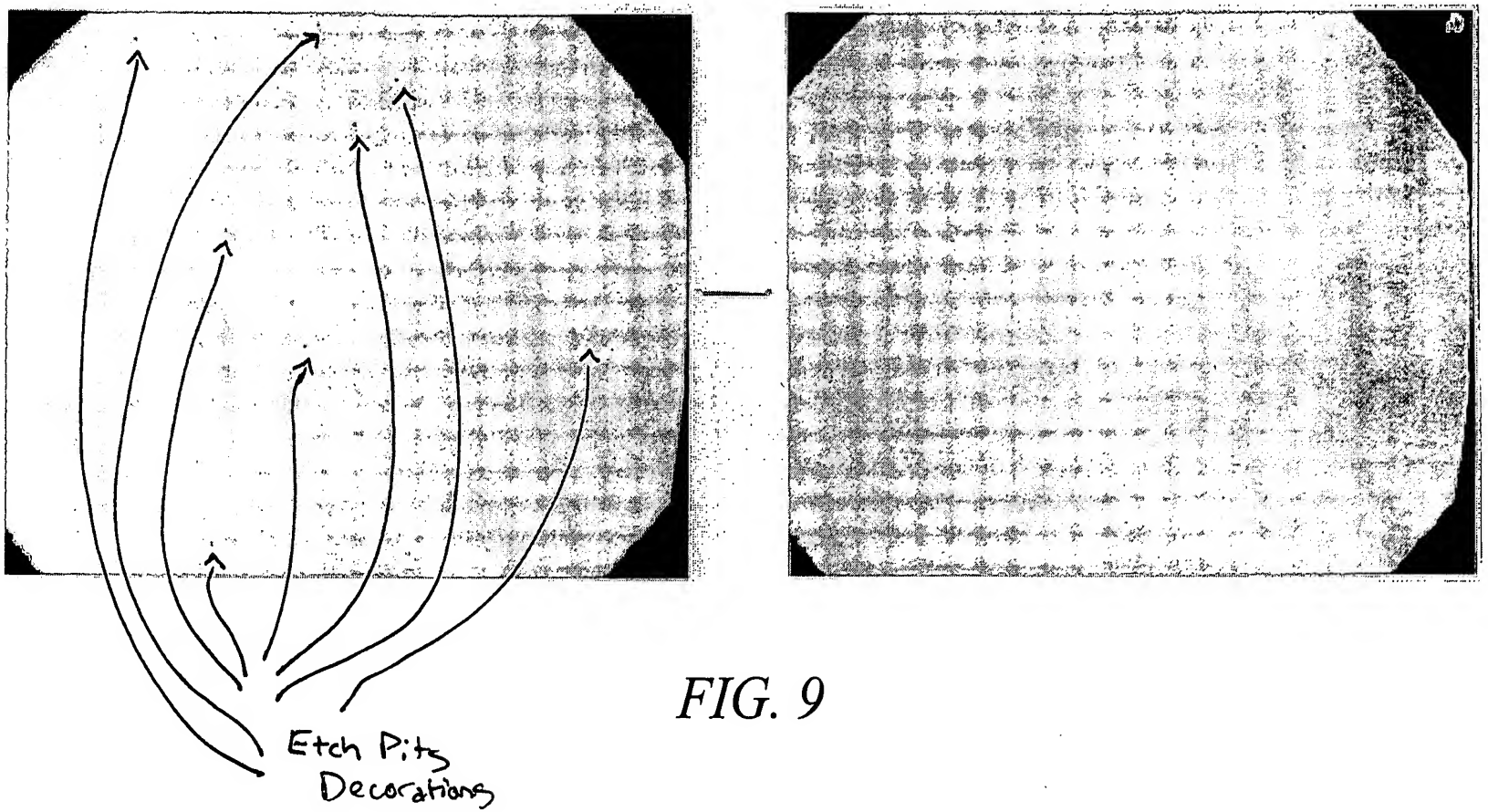

FIG. 9

As-doped germanium

10 sccm arsine (1% in H_2)
mag. 200x
resistivity 19.65 mΩ•cm

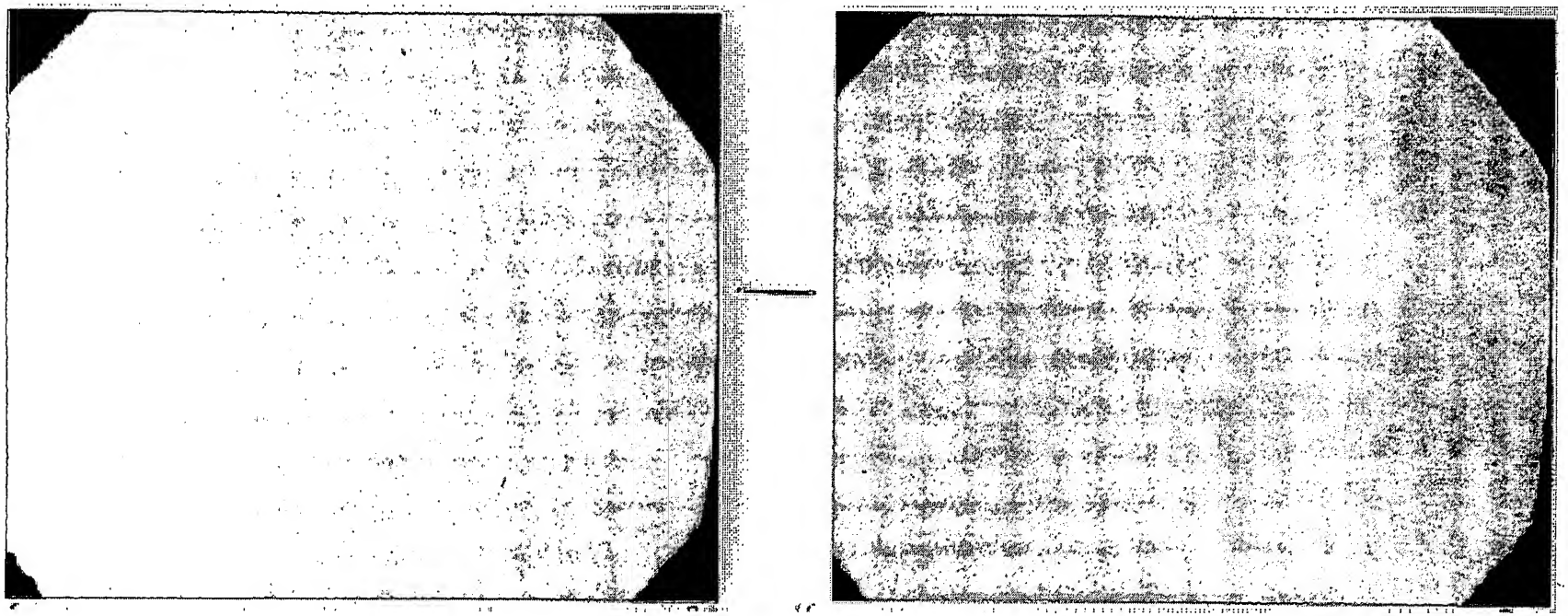

FIG. 10

As-doped germanium

30 sccm arsine (1% in H_2)
mag. 100x
resistivity 9 mΩ•cm

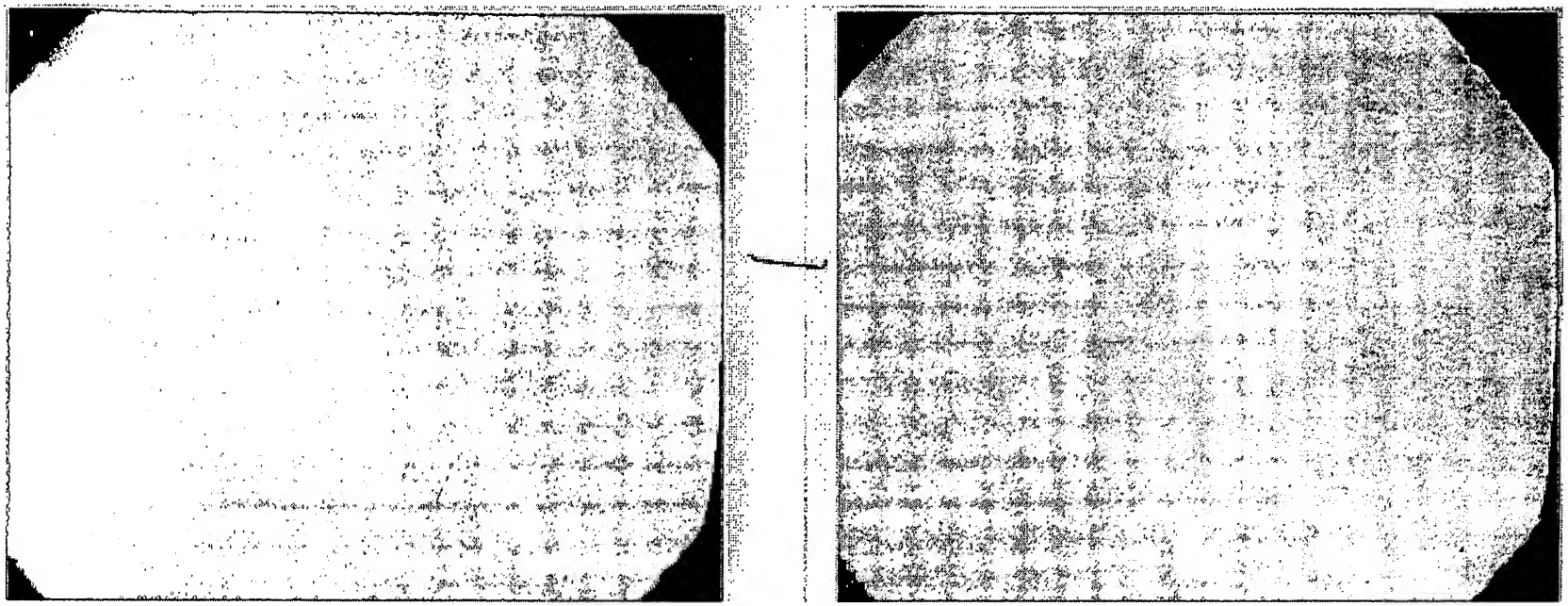

FIG. 11

P-doped germanium

1 sccm phosphine (1% in H_2)
mag. 200x
resistivity 1.27 mΩ•cm

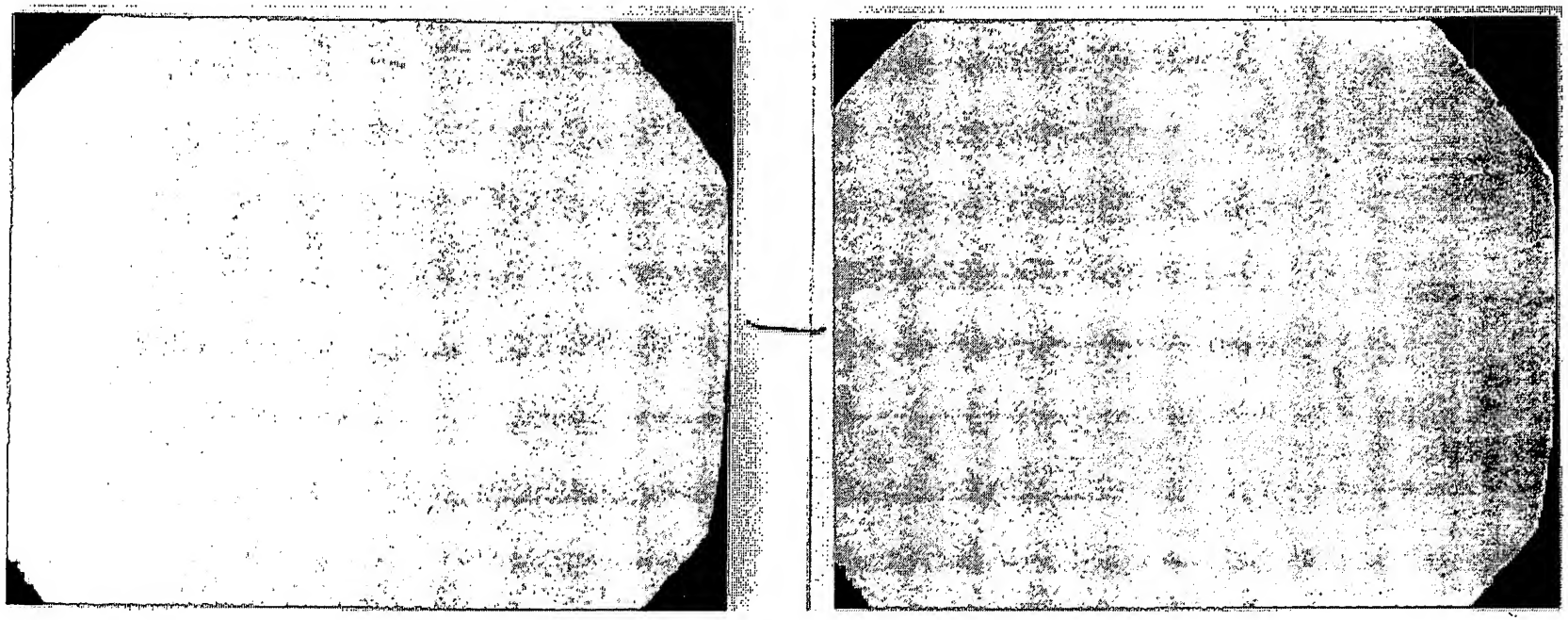

FIG. 12

Intrinsic germanium

mag. 100x
resistivity 0.1 Ω•cm

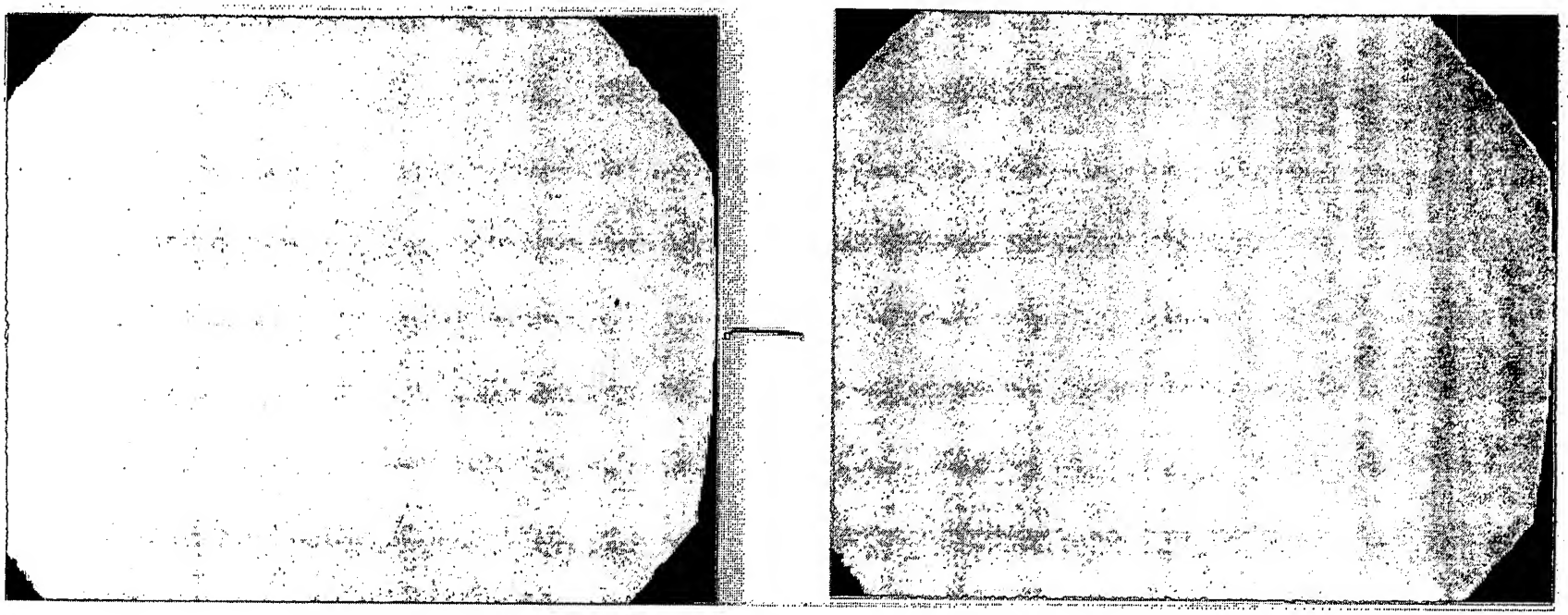

FIG. 13

FIG. 14

P-doped germanium

1 sccm phosphine (1% in H_2)